How this investigation fits within the “Concept and Lesson Map”:

**Overview for Unit 1: Goldfish and Guppies**

* Students observe and compare the structure and behavior of goldfish and guppies.
* Observe and describe the environment in which goldfish and guppies survive.

**Overarching question(s) for this whole investigation:**

* How do parts of the goldfish help it live in its environment?

**Attending to “How People Learn”**

How People Learn Key Finding #1: Preconceptions

**Eliciting Student Ideas:**

* Classroom discussion starter, use as whole class: Is it an Animal? & Is it a Plant? (adapted from: *Uncovering Student Ideas in Science*, P.Keeley, et al.)
* Class discussion: Introduce the word ‘environment’ by discussing the classroom environment. What are the parts of the classroom environment? Could use National Geographic Book from *Windows on Literacy*, Animal Habitats.
* Have students draw their predictions of goldfish body parts in the top portion of the Prediction/Observation Journal Page prior to observing goldfish.

**Common Student Preconceptions:**

* “...young children could use only two groups at the same time...” Driver, R., Squires, A., Rushworth, P., and Wood-Robinson, V. (1994), *Making Sense of Secondary Science.* 24.
* “...younger children (up to 13) seemed to think in terms of the needs of individual organisms rather than of populations.” Driver, R., Squires, A., Rushworth, P., and Wood-Robinson, V. (1994), *Making Sense of Secondary Science.* 63.
* Read pages 101-102 of Benchmarks for Science Literacy.

How People Learn Key Finding #2: Facts/Concepts/Knowledge

**WA State Content Standards “Science Domains” (EALR 4)**

* K-1 LS2B A *habitat* supports the growth of many different plants and animals by meeting their basic needs of food, water, and shelter.

**WA State Science Standards “Crosscutting Concepts and Abilities” (EALRs 1-3)**

* K-1 INQA Scientific *investigation*s involve asking and trying to answer a *question* about the *natural world* by making and recording *observations*.
* K-1 INQB Many children's toys are *models* that represent things in some ways but not in other ways.
* K-1 APPD Counting, classifying, and measuring can sometimes be helpful in solving a problem
* K-1 SYS A Living and nonliving things are made of parts. People give names to the parts that are different from the name of the whole object, plant, or animal.

**Key Understandings For the Teacher:**

* Read pages 6-9 of Investigation 1, Caring for Goldfish and Guppies and Teaching Children about Goldfish and Guppies.
* The word ‘environment’ is not used by FOSS in the teacher guide, but important vocabulary to build throughout this investigation.

How People Learn Key Finding #3: Metacognition

Metacognition: How did my thinking change? What caused the change? How did I come to believe this?

Using the Prediction/Observation Journal Page for goldfish, have students draw their predictions of goldfish body parts in the top section prior to observing the goldfish. Have students draw their observations of goldfish body parts in the bottom observation section of the Prediction/Observation Journal Page for goldfish.

**Suggested Assessments for Student Understanding:**

* Probe for student understanding when students are working with their aquarium models.
* Assessment questions to focus on in discussion or for individual teacher scribed journal entries: **If someone showed you an animal that you had never seen before, how would you know if it was a fish? What would you look for?**

**Additional Information**

**Materials and Student Management**

* Use FOSS Student Sheet #30 (home/school connection page) to have students progressively add animals to the picture of the environments after investigating each animal. Students color and cut out the picture of the animals, then glue them to the picture in the correct environment for that animal. This is a page in their science notebook that students’ will refer to after each investigation. This sheet could also be re-done at the end of the unit as an assessment piece.
* Understanding about the definition of ‘environment’ should be included in making of the paper aquariums, Part 3 of Investigation1.

Timing Considerations

* There is some time required to set up the aquariums to begin the investigation.
* Water for the aquarium should sit for 24 hours.
* Order live organisms ahead of date needed.Check with distributor for time needed for delivery, often this is 3-6 weeks.
* It may be easier (and quicker) to purchase goldfish, guppies, and elodea locally.
* Making paper aquariums will take some time and may go more smoothly with a helper.
* Precutting the paper into 4 parts (shown on page 23) will help.